

AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior versions of the claims:

1. (Currently Amended) A self-cleaning catalytic chemical vapor deposition apparatus ~~which forms~~ for forming a thin film, ~~by using a catalytic action of a resistance heated catalytic body within a reaction chamber capable of being evacuated to a vacuum, characterized in that the apparatus comprises~~ comprising:

a reaction chamber comprising a catalytic body,

a constant-current heating power supply circuitry connected to the catalytic body,

a constant-voltage bias voltage power supply connected to the heating power supply circuitry to apply a bias voltage to the catalytic body across two terminals of the heating power supply circuitry,

a cleaning gas that comprises one of an inert gas or a reducing gas,

a gas-supply port through which [[the]] a cleaning gas is introduced in the reaction chamber, and

means for changing the polarity of the bias voltage applied across the two terminals of the heating power supply circuitry based on a kind of the cleaning gas, and

means for heating the catalytic body at about 1700 °C during substantially an entire duration of self-cleaning;

wherein the cleaning gas removes an adhering film which has adhered to the interior of the reaction chamber while suppressing etching of the catalytic body itself on the basis of a radical species generated when the cleaning gas comes into contact with

~~the resistance heated catalytic body and is decomposed, the bias voltage applied to the catalytic body, and the polarity of the bias voltage.~~

2. (Previously Presented) The self-cleaning catalytic chemical vapor deposition apparatus according to claim 1, further comprising a radical species generator which decomposes the cleaning gas into a radical species and introduces the radical species into the reaction chamber.

3. (Original) The self-cleaning catalytic chemical vapor deposition apparatus according to claim 1, characterized in that the cleaning gas is a mixed gas of a halogen-containing gas and either an inert gas or a reducing gas.

4-5. (Cancelled).

6. (Previously Presented) The self-cleaning catalytic chemical vapor deposition apparatus according to claim 3, characterized in that the halogen-containing gas is any of gases selected from the group consisting of NF_3 , HF , C_2F_6 , C_3F_8 , SF_6 , CF_4 , CClF_3 , C_2ClF_5 and CCl_4 or combinations of the gases, that the reducing gas is H_2 , and that the inert gas is a noble gas.

7. (Original) The self-cleaning catalytic chemical vapor deposition apparatus according to claim 1, characterized in that the cleaning gas is a mixed gas of a halogen-containing gas and H_2 and that the bias voltage of a positive polarity is applied.

8. (Original) The self-cleaning catalytic chemical vapor deposition apparatus according to claim 1, characterized in that the cleaning gas is a mixed gas of a halogen-containing gas and Ar and that the bias voltage of a negative polarity is applied.

9. (Previously Presented) The self-cleaning catalytic chemical vapor deposition apparatus according to claim 1, further comprising a monitoring device which detects the occurrence of etching of the catalytic body itself on the basis of electric resistance of the catalytic body.

10. (Withdrawn) A cleaning method of a catalytic chemical vapor deposition apparatus which forms a thin film by using a catalytic action of a catalytic body which is resistance heated within a reaction chamber capable of being evacuated to a vacuum, the cleaning method comprising a step of applying a bias voltage of a prescribed polarity to a catalytic body which is resistance heated, a step of introducing a cleaning gas, a step in which the cleaning gas comes into contact with the catalytic body which has been resistance heated and is decomposed to generate a radical species, and a step of removing an adhering film which has adhered to the interior of a reaction chamber without etching the catalytic body itself.

11. (Withdrawn) The cleaning method of a catalytic chemical vapor deposition apparatus according to claim 10, characterized in that the step of introducing a cleaning gas is a step of decomposing the cleaning gas into a radical species and introducing the radical species into the reaction chamber.

12. (Withdrawn) The cleaning method of a catalytic chemical vapor deposition apparatus according to claim 10, characterized in that the cleaning gas is a mixed gas of a halogen-containing gas and either an inert gas or a reducing gas.

13. (Withdrawn) The cleaning method of a catalytic chemical vapor deposition apparatus according to claim 10, characterized in that the cleaning gas contains either an inert gas or a reducing gas and that a bias voltage of a polarity determined on the basis of the kind of the inert gas and the reducing gas is applied.

14. (Withdrawn) The cleaning method of a catalytic chemical vapor deposition apparatus according to claim 10, characterized in that the cleaning gas is a mixed gas of a halogen-containing gas and a reducing gas when the bias voltage of the prescribed polarity is zero.

15. (Withdrawn) The cleaning method of a catalytic chemical vapor deposition apparatus according to claim 12, characterized in that the halogen-containing gas is any of gases selected from the group consisting of NF_3 , HF , C_2F_6 , C_3F_8 , SF_6 , CF_4 , CClF_3 , C_2ClF_5 and CCl_4 or combinations of the gases, that the reducing gas is H_2 , and that the inert gas is a noble gas.

16. (Withdrawn) The cleaning method of a self-cleaning catalytic chemical vapor deposition apparatus according to claim 10, characterized in that the cleaning gas is a mixed gas of a halogen-containing gas and H_2 and that the bias voltage of a positive polarity is applied.

17. (Withdrawn) The cleaning method of a catalytic chemical vapor deposition apparatus according to claim 10, characterized in that the cleaning gas is a mixed gas of a halogen-containing gas and Ar and that the bias voltage of a negative polarity is applied.

18. (Withdrawn) The cleaning method of a catalytic chemical vapor deposition apparatus according to claim 10, characterized in that in addition to the aforementioned constitution, the occurrence of etching of the catalytic body itself is monitored in situ on the basis of electric resistance during cleaning.

19. (Cancelled).

20. (Previously Presented) The self-cleaning catalytic chemical vapor deposition apparatus according to claim 1, wherein the reducing gas comprises hydrogen.